DOCUMENT RESUME

ED 098 546 CS 001 487

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TITLE An Information Support System for the Teacher as Instructional Manager.
PUB DATE Apr 74
NOTE 7p.; Paper presented at the Annual Meeting of the American Educational Research Association (Chicago, April 15-19, 1974)

EDRS PRICE MF-$0.75 HC-$1.50 PLUS POSTAGE
DESCRIPTORS Educational Accountability; Elementary Education; *Field Studies; *Information Systems; Programed Instruction; Reading Achievement; *Reading Instruction; Reading Programs; Reading Research; *Teaching Methods
IDENTIFIERS Philadelphia

ABSTRACT

This paper describes the field implementation of a multi-level information feedback system developed in the School District of Philadelphia, discusses some of the problems involved in its implementation, and shares some of the insights gained in the process. The program, which is designed to improve the reading skills of students, is oriented toward the instructional process, includes data related to pupil performance and pupil characteristics, and provides information for administrators and teachers responsible for the education of over 100,000 of the school system's pupils. (RB)

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AN INFORMATION SUPPORT SYSTEM FOR THE TEACHER AS INSTRUCTIONAL MANAGER

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Paper presented at the American Educational Research Association Convention, Chicago, April 1974.

CS 001 487

An Information Support System for the Teacher as Instructional Manager

-- James E. Scheib

An all too unfamiliar statement about offices of research and evaluation is: "We serve classroom teachers." Collecting and scoring standardized tests administered by classroom teachers at the direction of central administrators does not qualify for this motto. Seldom are research activities brought "down" to the scope of the classroom teacher. Unless you can affect classroom teaching, you do not influence education, except on paper. The great majority of classrooms retain "group" instruction despite many varied attempts at individualization of instruction. The reason for this is that most teachers are not able to generate, analyze, and act on the tremendous amount of information needed to check, for each pupil, on the many specific objectives embodied in their curriculum.

One of the greatest weaknesses in American education today is the failure to help teachers do what we have known for decades must be done. Teachers do not need more techniques. Teachers need support in implementing the proven methods so that the "minimum essential" skills are mastered by all, while more advanced students continue to move ahead.

The most obvious way to reduce the wide variety of instructional levels for which the teacher must plan is to group homogeneously.

The remainder of the dilemma is left to the carefully balanced combination of group instruction and individual guidance. Many approaches are possible here including the use of programmed materials or work books built around domain referenced measures. Most of the new reading materials using these systems are expensive, consumable, and involve a great deal of record keeping and testing. Here is where support can be given to the classroom teacher.

Systematic instruction in the basic skills entails good testing techniques for placement, diagnosis, and mastery; the latter under the proper circumstances might be called grading and/or promotion. Test construction, production, scoring, and reporting are all too often left to the area of the teachers' informal measures. Although this is often the only alternative for many areas of the curriculum it need not be the case for all, especially those minimum essential basic skills such as reading. With populations whose general language background is seriously lacking, it cannot be assumed that if children do not get these basic skills in the early grades, that they will pick them up later on.

Screening for children with serious language deficits should be systematic and objective. You need instruments which can be used throughout large school systems without great expense. They must be developed instruments whose criterion behavior is important in itself in the sense of a criterion-referenced test. In addition, they should have at least "local" norms so that teachers know "how much is enough for now."

In an attempt to help managers of reading programs designed for deprived children in Philadelphia, Research Associates began to develop "mastery tests" in key areas of reading. The characteristics needed to both serve the teacher and generate "state-of-the-skill" information for project managers were:

1. The test should be able to be administered in a group session.
2. The test should yield individualized results in a pattern easily examined like an item grid.
3. There should be a group summary by item for group instruction.
4. Scoring should be objective and efficient with no more than a week's turnaround time.
5. The test should have alternate test capabilities.

The Sight and Sound Inventory which I am going to describe as an example of such an instrument meets these criteria. It is a phonics inventory that is administered to a whole class at once; it is in multiple choice format, is machine scored, and the report is a computer printout. The report and the scoring program are those described here today by Frances Byers.

In the 1970-1971 school year some portions of The Philadelphia School District mandated diagnostic testing using an informal phonics inventory developed by Morton Botel of the University of Pennsylvania. Teachers were to give the test, score it, and then build an item grid showing which students answered each item correctly. The clerical task was unreasonable where cycling and team teaching resulted in one teacher constructing grids for 150 students. Scoring was less than objective, and summarizing results for local norms was a bulky task. This test also was dependent upon writing ability.

In the 1971-1972 school year the first version of the Sight and Sound Inventory was tried out. Form A consisted of 26 items: 18 initial consonants and eight final consonants. Form B consisted of 45 items: 19 consonant blends, four digraphs, four final sounds of multiple letters, three rhyming sounds, nine vowel sounds of single letters, and six vowel sounds when combined with other letters. The answer sheets were digitek forms with five choices per item. The teacher read printed instructions item by item. The students were told what portion of words to attend to; the teacher would say each word twice, and the students were to find the letters representing that sound among the choices for that item. On this version the students were to blacken the letter itself. The choices had been printed in the locations of the response boxes. Alternate word lists were provided for later testings but the answer key and item tested remained the same. The test was given to a cross-section of elementary students in two of Philadelphia's eight districts. Item analyses were generated and most

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items were revised. The general finding was that most look-alike distractors were not working well, while the sound-alike distractors were.

The second version was prepared over the summer with the cooperation of language-arts supervisors from the Curriculum Office. Form B was expanded to 58 items and the answer sheets were again digitek forms, this time with the response boxes added. During the 1972-1973 school year the test was used extensively throughout the elementary grades in one quarter of the city. Some of the analyses of one districts' scores are shown in Table 1.

Table 1

Fall 1972 Sight and Sound Results District 2
The School District of Philadelphia

Form	Grade	$\bar{X}$	of	SD	KR-20	S_e	N
A	1	12.6	26	7.25	0.92	2.03	252*
A	2	20.8	26	6.18	0.93	1.62	1618
A	3	23.4	26	4.00	0.90	1.27	1524
A	4	24.1	26	3.11	0.86	1.14	1418
A	5	24.6	26	2.41	0.81	1.03	1068
B	2	26.2	58	12.8	0.94	3.05	528*
B	3	36.2	58	13.6	0.95	2.94	1122
B	4	40.8	58	11.0	0.94	2.79	1357
B	5	41.9	58	11.7	0.94	2.74	1659
B	10	39.2	58	10.0	0.92	2.84	310**

Form: Level of the test

$\bar{X}$: mean
of : total number of items
SD : standard deviation
KR-20 : Kuder Richardson formula 20
S_e : standard error of measurement
N : number of students tested
* : better achieving students
** : lower achieving students

The district is an inner city one where 25 of 27 elementary schools presently qualify for Federal funds under Title I E.S.E.A. guidelines for educationally deprived children. Item intercorrelations were found to be low, while internal consistency was high. Most students were approaching mastery of Form A by third grade while fifth graders continued to show deficiencies on Form B. The results show fewer children were tested in grade one with Form A and grade two with Form B. These were for the most part better than average for the district. Some data is included from low-achieving tenth graders to show that when used as a screening instrument with older students, results are similar to those in fourth and fifth grades.

The third version of the test now in use is on a two-sided NCS (National Computer Systems) form. Minor changes include the use of nonsense syllables to control for spelling knowledge in some items and the addition of items with combinations of three letters.

Recent thinking about test validity is throwing more of the responsibility for this test characteristic toward the test user. This question is not: "Is this a valid measure?" (whatever that means), but rather: "Is this instrument useful for your purposes and how do you know that it is?" The Sight and Sound Inventory tests recognition of sounds as parts of words pronounced twice by the teacher. Responses are free from handwriting and encoding limitations. Guessing is a factor; therefore interpretation by item cannot be literally indicative of mastery. It asks; given the correct answer among five choices, is the student able to identify correctly the letters which represent the portion of the word (beginning, middle, or end) to which his attention was to be directed by the instructions? Items missed probably need teaching or review. Items marked correcly may have been

known or guessed. The pattern of incorrect responses should be the basis for planning remediation. Instructions include the warning to teachers to substitute other words for those which coincidentally would be included in sight vocabulary lists being taught. Second grade results for classes in four elementary schools representative of the district described above showed a correlation of +0.80 with the vocabulary subtest of the California Achievement Test - 1970 edition, Level 1, Form A. Twenty of the 92 items on this subtest tested similar items as the Sight and Sound Inventory.

Most importantly, the test has been used by teachers to plan remediation in basic reading skills with information which, in most cases, would not have been available otherwise. When you provide data which teachers would like to have but can't generate, and you see them use it after it is provided, then you can say, "We serve classroom teachers."